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Books Reconsidered

Perception and Communication: D.E. Broadbent

During the 1930s and 1940s, there was relatively little research into attention. This occurred in part because the behaviourists mostly regarded attention (and the related notion of consciousness) as not being an appropriate topic of study. The situation began to change during and after the Second World War, when it became important in designing air traffic control systems, to ensure that those monitoring radar screens maintained an adequate level of vigilance.

Broadbent's (1958) book *Perception and Communication* was influenced in important ways by such practical concerns, but its main contribution was theoretical. He assumed that we can deal with only one message at a time in terms of thorough processing, with rejected messages being held transiently in a short-term memory store. There was a filter or switching mechanism which permitted the selected message to gain access to the systems involved in thorough processing. The filter, which served to block unattended messages, could switch to one of the messages held in short-term memory, which could then receive full processing. According to the theory proposed by Broadbent, the filter selects on the basis of the physical characteristics of the presented messages (e.g. the direction from which they come; whether the voice is male or female). Finally, Broadbent assumed that information could be prevented from decaying by the use of active rehearsal.

The book also deals with a number of other important topics. For example, there are good reviews of the literature on vigilance and on the effects of noise on performance. Of particular personal interest to me are some of his speculations on the differences between introverts and extroverts. He suggested that introverts can be regarded as individuals who make use of information over long time samples, whereas extroverts tend to make use of information over short time samples. These speculations (which have to this day never been investigated thoroughly) are appealing in various ways. Firstly, they provide a way of understanding the greater changeability of extroverts than of introverts. Secondly, they involve a major role for the cognitive system in understanding personality, a view which has become considerably more popular in the years since 1958.

In bare outline, Broadbent's theoretical contribution may sound modest. However, this would be a travesty of the truth. The proposal at the heart of his contribution was that we can regard people as information-processing systems, in which the flow of information and the processes involved can be specified. For example, instead of treating attentional processes separately from those of short-term memory, Broadbent assumed that they were interacting components of a larger system. It is probably no exaggeration to claim that the most distinctive theoretical contribution of cognitive psychology has been the attempt to provide detailed specifications of the processes and structures involved in cognition. While the history of psychology (as of most other scientific disciplines) provides ample confirmation of the notion that there is nothing new under the sun, I am willing to take the risk of claiming that the publication of *Perception and Communication* was the defining moment for the emergence of contemporary cognitive psychology.

Broadbent's enormous influence on the development of cognitive psychology was obvious at a relatively general level. Thus, for example, most cognitive psychologists nowadays would agree with his view that human cognition is based on a complex, multiple-component, interactive system, in which proper consideration needs to be given to attention, short-term memory, rehearsal, and so on. However, Broadbent's theory also had a substantial impact at a more specific level. This is most obvious in the case of the multi-store theory of memory proposed by two American psychologists (Atkinson & Shiffrin) ten years after the publication of *Perception and Communication*. Their theory closely resembled Broadbent's in many respects, and became perhaps the dominant memory theory of the 1970s.

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Those who are less impressed by Broadbent's contribution than I am might reasonably point out that few of his specific theoretical ideas have stood the test of time. Somewhat embarrassingly, two Oxford undergraduates (Gray & Wedderbrun) published an experimental disproof of some of Broadbent's key ideas only two years after the publication of *Perception and Communication*. In essence, they presented something like "2 goes 7" to one ear while at the same time presenting "who 9 there" to the other ear. The subjects were instructed to recall what they had heard in whatever fashion they chose. They generally said, "who goes there; 2 9 7", demonstrating that the filter could select on the basis of meaning. This eventuality was not allowed for within Broadbent's theory.

Some scientists attach great significance to experimental disproofs of aspects of theories, but my own view is that such disproofs often do not necessitate the total abandonment of the theory in question. For example, when Newton published his *Principia*, it was well known that it could not explain the motion of the moon. In spite of that, the successful predictions and enhanced understanding produced by Newtonian theory meant that it was retained essentially unchanged for approximately 200 years. While Broadbent's book does not quite match up to Newton's *Principia*, the same principle applies, namely, that a major theory can remain valuable in spite of failures of prediction.

To conclude, Broadbent's book was an intellectual landmark in the development of cognitive psychology. It established a theoretical framework and an agenda for research which have weathered the past 35 years in good shape. Research over that time has led to development of several new theories within cognitive psychology, but many of those new theories still bear the mark of the master.

Reference

BROADBENT, D.E. (1958) *Perception and Communication*. London: Pergamon.

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